

U.S. Patent Application Serial No. 10/647,230  
Amendment filed December 9, 2004  
Reply to OA dated October 8, 2004

### **REMARKS**

Claims 1-6 are pending in this application. Claims 1 and 3 have been amended. The applicants respectfully submit that no new matter has been added. It is believed that this Amendment is fully responsive to the Office Action dated **October 8, 2004**.

Support for the amendment to claim 1 is discussed below.

The amendment to claim 3 places claim 3 into independent form, incorporating the limitations of the base claim and intervening claims. Applicant submits that the scope of claim 3 is not changed by this amendment.

**Claims 1, 2, 4-6 are rejected under 35 U.S.C. §102(b) as being anticipated by Shiue et al. (U.S. Patent No. 5,846,269). (Office action paragraph no. 2)**

The rejection is overcome by the amendment to claim 1. In the amendment to claim 1, the claim recites "said metal bond matrix consisting essentially of: a Cu alloy as a main component; zirconium; and titanium". The claim has also been correspondingly amended to clarify that the explicitly recited zirconium and titanium are present as one of an alloy phase, a mixed phase, and an intermetallic compound.

Support for the recitation that the metal bond matrix consists essentially of a Cu alloy as a main component, zirconium, and titanium, may be found in part in original claim 1, which recited that the matrix contains a Cu alloy as a main component. Support for the recitation of Zr and Ti as the remaining components may be found in the specification on page 7, lines 1-3; and in particular

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on page 7, lines 14-17, where the metal components can be seen to be a bronze containing 23 wt% Sn (i.e., a Cu alloy), a Zr compound, and a Ti compound. As noted at the bottom of page 7, the compounds are dissociated during brazing, and the binder is evaporated during brazing (page 10), so the resulting metal bond matrix will contain only the metals.

Claim 1, as amended, is not anticipated by Shiue et al. because Shiue et al. requires component (d) elemental carbon, and component (e) titanium carbide in the disclosed bond material (column 2, lines 29-30). The carbon and titanium carbide will be present in Shiue's bond material after brazing, and this material does not meet the "consisting essentially of ..." compositional limitation of claim 1.

Reconsideration of the rejection is respectfully requested.

**Claim 3 is rejected under 35 U.S.C. §103(a) as being unpatentable over Shiue et al. (U.S. Patent No. 5,846,269). (Office action paragraph no. 4)**

The rejection of claim 3 is respectfully traversed, and reconsideration of the rejection is respectfully requested. As noted above, claim 3 has been amended to be in independent form, and Applicant submits that the scope of claim 3 is unchanged by this amendment.

The Examiner indicates that the general range for Ti +Zr disclosed in Shiue et al. overlaps the claimed range. Since Shiue et al. discloses 10-20 parts by weight titanium and 5-15 parts zirconium (out of a total of 120.1 to 155.5 parts), the Examiner is correct that there is a small overlap in Ti + Zr content with the claimed range. For example, in Shiue et al., with 10 parts by weight

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titanium and 5 parts zirconium, the total would be 120.1 to 135.5 parts, allowing a Ti + Zr content of as low as 11.0%. Shiue's maximum Ti +Zr content would appear to be about  $35/140.5 = 24.9\%$ .

In traversing the rejection, Applicant argues that "unexpected results" arise from the limitation recited in claim 3, that "the content of said at least one of an alloy phase, a mixed phase, and an intermetallic compound of Zr and Ti in said metal bond matrix is in a range of **6.4 to 14.1 wt%**".

Applicant refers to the data in the present specification, in particular the data in Table 1 on pages 9-10. Applicant notes that several combinations of amounts of Zr and Ti are presented in Table 1. The values in data columns 3-6 can be seen to fall within the limitations of claim 3. (For example, in column 3, Zr is 3.2 wt% and Ti is 3.2 wt%, for a total of **6.4 wt%**; in column 6, Zr is 7.05 wt% and Ti is 7.05 wt%, for a total of **14.1 wt%**). Columns 3-6 can be seen to display a higher value of strength N than the other columns in the Table, in which the value of Zr +Ti is outside the claimed range.

Applicant submits that there is no suggestion in Shiue et al. for this effect on the strength, and that these data therefore demonstrate an unexpected effect commensurate in scope with the recitation of claim 3. Claim 3 is therefore novel and non-obvious over Shiue et al.

In view of the aforementioned amendments and accompanying remarks, claims 1-6, as amended, are in condition for allowance, which action, at an early date, is requested.

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If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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